



Summary of Fishery Surveys Lake Ten, Price County, 2009 – 2010

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in 2009 and 2010 to assess the status of important fish populations in Lake Ten. Fyke netting in October yielded useful information on black crappies. Fyke nets deployed again shortly after the 2009 spring thaw targeted northern pike and yellow perch. A late-spring electrofishing survey documented the abundance and size structure of largemouth bass and bluegill populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is based on known angler behavior.

Survey Effort

On October 7–9, 2009 at water temperature 54–56°F, we set three fyke nets to intercept fall movements of black crappies, tending the nets once after two nights for 6 net-nights of fishing effort. On April 13–14, 2010 we set three fyke nets at locations chosen to intercept early-spring spawning species and fished them overnight for one night (3 net-nights) when water temperature averaged 50°F. With water temperatures at 67°F our May 20, 2010 electrofishing survey should have coincided with the early spawning activities of largemouth bass and bluegills. We sampled the entire 1.41 miles of shoreline in 1.03 hours, including 0.52 mile sub-sampled for all species in 0.45 hour.

Habitat Characteristics

Lake Ten is a 43-acre seepage lake located about 6½ miles southwest of Phillips, WI. The average depth is 17 feet, maximum depth is 37 feet, and 7% of the surface area is less than 3 feet deep. The water is exceptionally clear (Secchi depth = 11 feet) compared to nearby lakes that drain wetlands. Lakebed materials are 60% sand, 18% gravel, 2% rock, and 20% muck. With high water clarity rooted aquatic vegetation grows around the entire perimeter to the 10-foot depth contour. Watershield, an aquatic plant commonly found in soft water lakes, grew at moderately high density in shallow areas. Mixed hardwoods and conifers on steep slopes cover 70% of the shoreline, and the rest is bog. In our electrofishing circuit we noted abundant submerged woody structure and low conductivity. The larger of Lake Ten's two islands is owned by the State of Wisconsin. Harmony Township enforces a slow-no-wake boating ordinance and maintains a public boat landing on the east shore. A narrow backing lane leads to the boat ramp.

Summary of Results

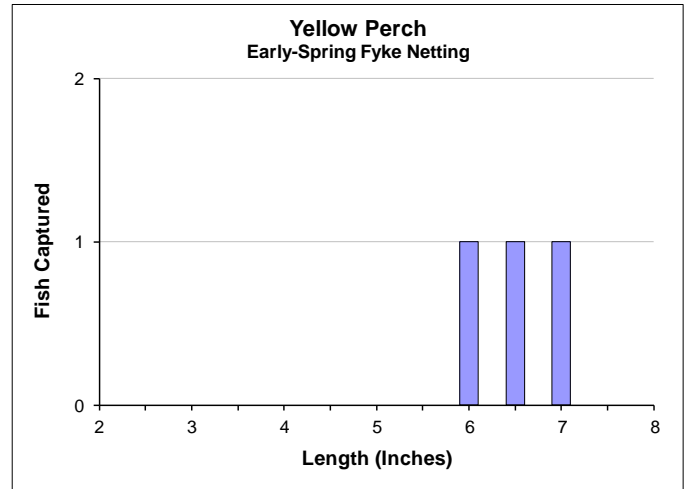
Our combined survey effort captured seven fish species. Largemouth bass and bluegills hold the primary roles in Lake Ten's predator-prey dynamics. Green sunfish, typically uncommon in our Price County surveys, were present in trace abundance. We found no smallmouth bass and no walleyes—the only fish ever recorded as stocked into Lake Ten in 1954 and 1964, respectively. Likewise, we captured no rock bass, no muskellunge, and only one northern pike (29 inches)—species encountered in low numbers in the 1971 and 1975 surveys.

Yellow Perch



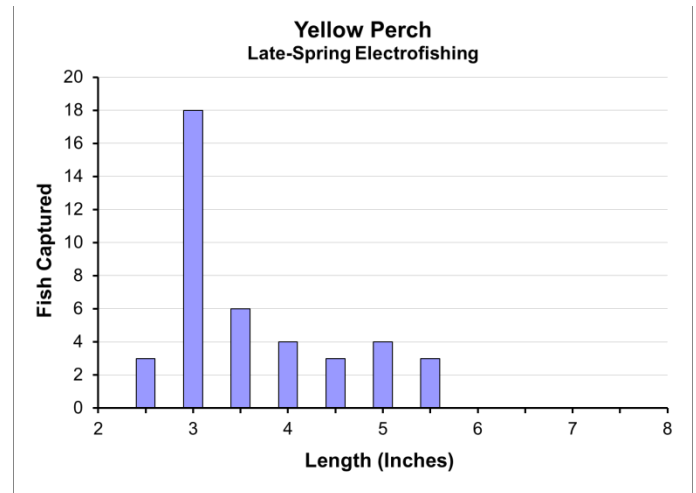
Early Spring Fyke Nets

Captured 1.0 per net-night $\geq 5"$
Quality Size $\geq 8"$ 0%



Late Spring Electrofishing

Captured 13 per mile or 16 per hour $\geq 5"$
Quality Size $\geq 8"$ 0%



Capture rate and size distribution of yellow perch in our early spring fyke netting and late spring electrofishing surveys show the importance of perch as the preferred food of largemouth bass and black crappies. However, with no individuals longer than 7 inches in our samples, the yellow perch population offers insignificant angling opportunity in Lake Ten. Though we did not analyze their length at various ages, yellow perch probably grow slowly and most die of natural causes before they can attain the sizes that anglers prefer to keep. This speculation is consistent with the premise that high water clarity often indicates low nutrient concentrations and low rates of biomass production. Our conjecture is further supported by presumed low angling pressure and netting and electrofishing capture rates that

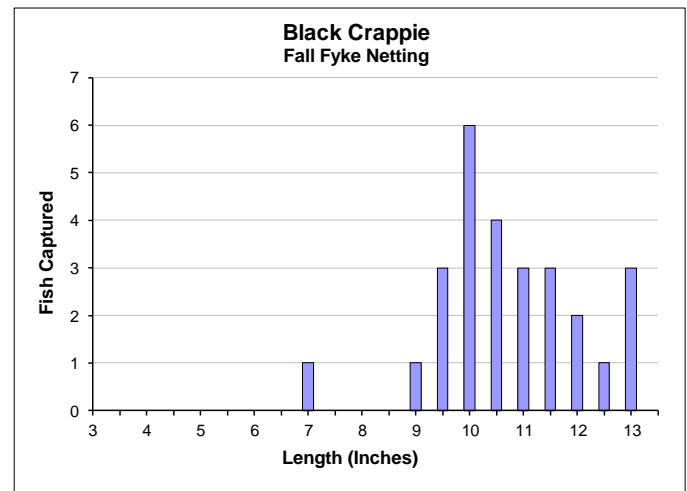
point toward low northern pike abundance. Both anglers and pike selectively eat the largest perch from the population. So, with few pike and little or no angling harvest we would expect the population to produce larger perch if growth rate was satisfactory. Consistent production of perch year classes should serve to keep black crappies growing at a rate statistically higher than the regional average.

Black Crappie



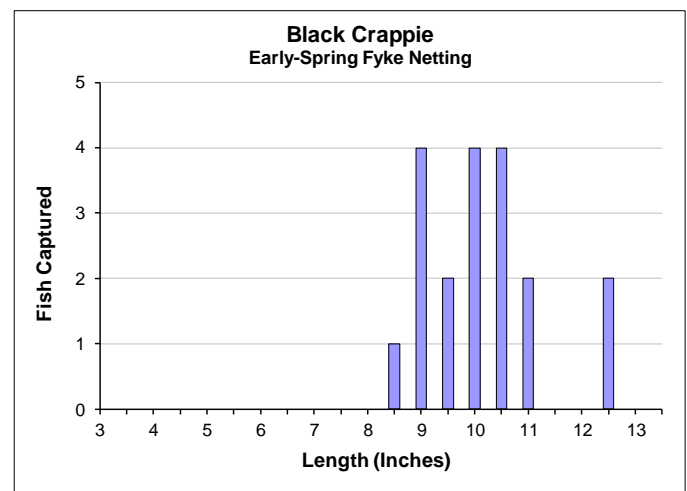
Fall Fyke Nets

Captured	4.5 per net-night $\geq 5"$
Quality Size $\geq 8"$	96%
Preferred Size $\geq 10"$	81%
Memorable Size $\geq 12"$	22%



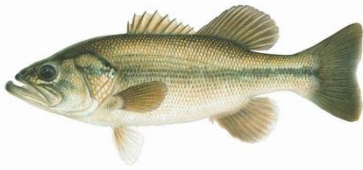
Early Spring Fyke Nets

Captured	6.3 per net-night $\geq 5"$
Quality Size $\geq 8"$	100%
Preferred Size $\geq 10"$	63%
Memorable Size $\geq 12"$	11%



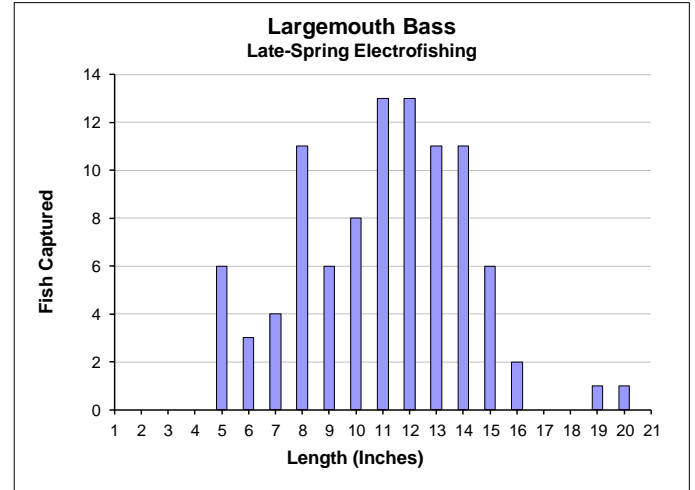
Fall and early spring fyke nets captured black crappies at similar rates that revealed moderately low population abundance, which under presumed low angling exploitation results in better-than-average growth and favorable shares of preferred- and memorable-size fish. Age analysis using scales revealed that black crappies in Lake Ten nearly attained 10 inches in 5 seasons of growth (average = 9.9; range = 9.3 – 10.8; $n = 15$) compared to the regional average length of 9.3 inches at age 5. Our samples represented eight cohorts produced in 2000 – 2007, but the scarcity of crappies < 9 inches long (age 3 and younger) suggests missing or weak year classes in two or three years immediately preceding our surveys. Environmental variables are known to influence reproductive success in crappie populations.

Largemouth Bass



Late Spring Electrofishing

Captured 59 per mile or 81 per hour $\geq 8"$	
Quality Size $\geq 12"$	54%
Legal Size $\geq 14"$	25%
Preferred Size $\geq 15"$	12%



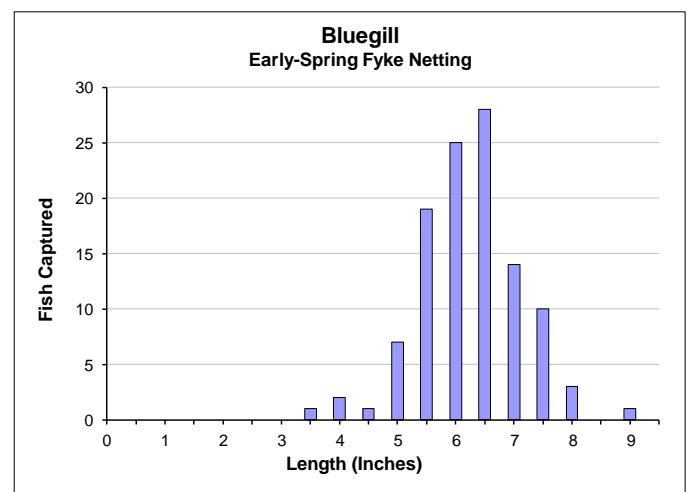
Late spring electrofishing captured largemouth bass at a high rate, indicating high population abundance that results in food competition among themselves and a slower-than-average growth rate. On average bass grew to 10.6 inches in 4 years (range = 9.5 – 11.4; n = 12), 13.4 inches in 6 years (range = 13.1 – 14.0; n = 8) and to legal size in their seventh growing season (average = 14.6; range = 14.2 – 14.9; n = 7). Average lengths of largemouth bass in Lake Ten were 0.5, 1.2, and 1.5 inches below the regional average length at ages 4, 6, and 7, respectively. Nearly all size and age classes were represented in our sample, demonstrating that natural reproduction consistently produces year classes to sustain the population. Despite their slow growth some individuals live long enough to approach or surpass memorable size 20 inches and longer. Abundant largemouth bass appear to be at least somewhat capable of eating enough young bluegills to partially control bluegill recruitment and prevent a “badly stunted” bluegill population in an infertile lake of this size, even when their preferred food (perch) is available.

Bluegill



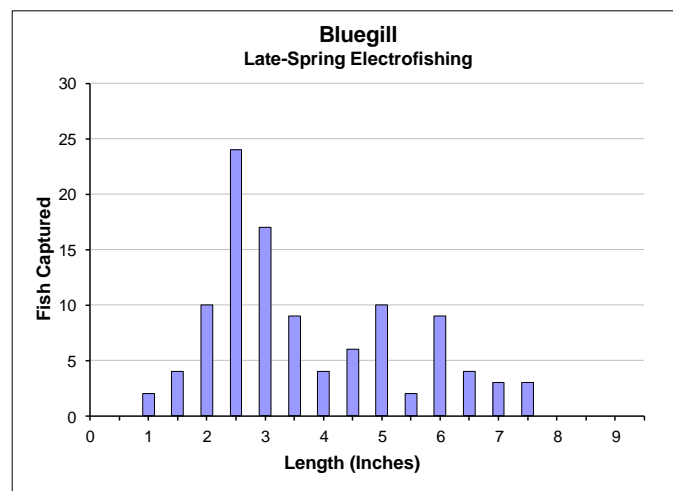
Early Spring Fyke Nets

Captured 37 per net-night $\geq 3"$	
Quality Size $\geq 6"$	73%
Keeper Size $\geq 7"$	25%
Preferred Size $\geq 8"$	4%



Late Spring Electrofishing

Captured 129 per mile or 149 per hour $\geq 3"$	
Quality Size $\geq 6"$	28%
Keeper Size $\geq 7"$	9%
Preferred Size $\geq 8"$	0%



Early spring fyke nets captured higher proportions of quality-, keeper-, and preferred-size bluegills compared to late spring electrofishing. Capture rates in both surveys point toward moderate population abundance. Though bluegills do not appear to be overly crowded, their growth rate was nonetheless slower than normal. Using a pooled sample of scales taken from bluegills of both sexes and all reproductive strategies, age estimates revealed that bluegills attained 5.9 inches in 6 years (range = 5.3 – 6.3; n = 9) and 7.6 inches in 10 years (range = 6.9 – 8.2; n = 7). Average lengths of bluegill ages 5 – 10 in Lake Ten was 1.0 – 1.4 inches lower than the regional average lengths in that age range. Fortunately, bluegills are long-lived in Lake Ten—a 9.2-inch fish in our sample was estimated to be 13 years old. Despite their slow growth some individuals do survive long enough to reach preferred size. Lake Ten's bluegill population has a long-known reputation of impaired growth and mediocre size structure. Attempts in 1971 to improve those parameters by suctioning fry from nests with a portable, gasoline-powered water pump had no lasting positive effect. Growth rate and size distribution in the bluegill population may be limited by the Lake Ten's low productivity, rather than excessive recruitment and high abundance.

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